

A few words on grapevine flowers and flowering

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It's grapevine flowering time in the Northern hemisphere. What a perfect time to share some insights into *Vitis vinifera* L. flowering & flower organisation (Figure 1).

Grapevine inflorescences are described as a panicle and bear pentamerous flowers. In general, a primary shoot differentiates / develops (year N) one to two inflorescences originating from the inflorescence primordia formed in the latent bud (winter bud) during the previous season (year N-1). Therefore, two seasons are required for complete inflorescence development.

The number of flowers on an inflorescence is variable & depends on the variety, the pedo-climatic conditions and grapevine physiology from pre bud break to flowering. Optimum carbohydrate reserve status and photosynthesis aids in flower development and fruit set.

The flowers of most domestic cultivars are perfect, containing both male and female parts (unlike the wild grapevine which has either pistillate or staminate flowers). The petals are interlocked to form a protective cap (calyptra) which subsequently dehisces from its base to release the single pistil and 5 stamens (bloom). The sepals do not undergo extensive development. Flower size is heterogeneous and is dependent on the position on the rachis. The pollen in the anthers release the volatiles that contribute to the bouquet of grapevines in springtime. Bloom can occur from a few days to a few weeks.

Many cultivars are thought to be to some extent self-pollinated, unlike the wild grapevine which requires insects for pollination. Self-pollination usually occurs prior to bloom. In seeded cultivars, fertilisation of at least one ovule from the four ovules that are in the two carpels of the ovary is required for the development of the ovary into a normal berry. However, seedless cultivars such as Sultana and Flame Seedless do not require successful seed development for ovary growth, and if fertilisation occurs, seeds are often aborted shortly thereafter leaving behind seed traces.

The seed number per berry is crucial for its development-size/composition/quality. This is because seeds release growth regulators important to cell division and expansion. Naturally, environmental and management factors also impact on final berry size.

The heterogeneity in the timing of pollination and fertilisation and of seed number per berry (which is impossible to control & standardise in the vineyard) leads to the asynchrony of berry development, with the consequence that at harvest a population of berries will never have the same ripening level.

Grapevine flower structure:

- 5 sepals (aborted)
- 5 fused petals forming the cap, also known as the calyptra
- 5 stamens
- 1 ovary = 2 carpels with 2 ovules in each

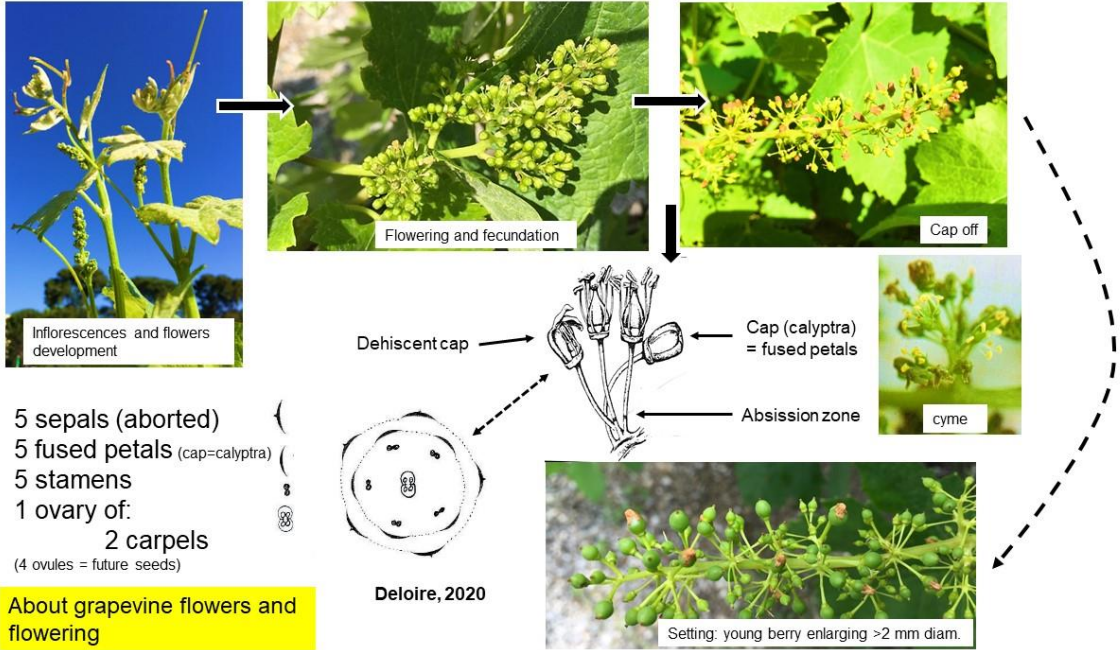


Figure 1: Grapevine flower structure and the different steps from flowering to berry set.